

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2

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DATE:

SUBJECT: Standard Chlorine Chemical Interim Response Actions Work Plan

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NYRB

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TO: Nick Magriples, OSC
RAB

Enclosed please find Section 3 of the Interim Response Actions (IRA) May 2007 work plan, "IRA Components and Design Requirements", as well as a discussion of the changes to the work plan made as a result of the NJDEP's regulatory review ("Responses to NOV Issues"). I also reviewed the work plan and "Responses to NOV" issues, and felt that the responses were acceptable, and that the corrections to the work plan made it an acceptable "interim" work plan. We have asked the DEP to produce a decision document of some kind for the IRA, so they are going to write something along the lines of an "EE/CA". The DEP will also retain the lead for this interim work, since it is being performed under a 1989 State Order.

At some point, we should be getting the corrected version of the final work plan, incorporating the changes discussed in the "Responses" section.

FYI, we've also just received a copy of the "Supplemental Remedial Investigation" work plan for the site, which describes what the PRP feels is the investigatory work still remaining at the site before a ROD can be written. NJDEP has indicated a desire to retain this site activity, but it's EPA management's feeling that we've been handed the lead on this site for a reason, and that's to make sure that the final comprehensive remediation is appropriate and happens in a timely fashion. So I believe EPA will now be pursuing its own Order with the PRPs regarding further remedial investigatory activity.

Encls.

3.0 IRA COMPONENTS AND DESIGN REQUIREMENTS

This section provides a description of the IRA components and associated design data necessary to implement the IRA at the SCCC and Diamond Sites. Descriptions of each of the major components, the design requirements for each, and the planned design activities are discussed. The plan locations of the major IRA components, including proposed AOC Policy consolidation areas (contingent upon material management decision outcomes – Figure 1-3) are shown on Figure 3-1.

3.1 PHYSICAL BARRIER WALL SYSTEM

The barrier wall system consists of a fully enclosing slurry wall installed around the entire perimeter of the combined Sites. The slurry wall will be keyed into the varved clay unit. The slurry wall will serve as a barrier to migration of impacted groundwater and DNAPL to the Hackensack River surface water and sediments and offsite properties. A steel sheet pile wall will be installed outboard of the slurry wall along the SCCC Site and Diamond Site frontage along the Hackensack River to serve as a structural element. The steel sheet pile wall will also be keyed into the varved clay. The sheet pile wall is a structural component (i.e., retaining wall) which is not necessary for the remaining inland Site perimeter. The performance of the response action will be evaluated through a post-construction monitoring program. The monitoring program will consist of water level measurements to ensure adequate groundwater containment as further discussed in Section 3.2. The monitoring program will determine head differentials across the slurry wall and between the fill and deep sand units. Results of the post-construction monitoring will be reported to the NJDEP.

Description:

The proposed fully enclosing physical barrier wall system will be constructed on the Diamond and SCCC Sites as shown on Figure 3-1. Figure 3-2 presents barrier wall details. A description of the barrier wall system is provided below:

1. A slurry wall will be installed along the entire perimeter of the combined Sites (i.e., along the entire frontage of the Hackensack River with the SCCC Site and Diamond Site, along the northern property boundary of the Diamond Site, the western property boundary of the Diamond Site, the western property boundary of the SCCC Site, and the southern boundary of the SCCC site). The slurry wall will be keyed a minimum of three feet into the varved clay to fully contain the shallow fill and deeper sand units. The slurry wall will be constructed with a top elevation of 7 feet above mean sea level (ft-msl) to accommodate (i.e., exceed) the projected maximum post-construction groundwater elevation on the outboard side of the slurry wall. Working platforms will be constructed as necessary to accommodate slurry wall installation.

Waste classification will be conducted using soil samples obtained (and analyzed) during completion of test borings performed along the proposed barrier wall alignment. Excess soils generated during construction of the slurry wall will be managed in accordance with the materials management decision flowchart (Figure 1-3). Based upon the specification to key the slurry wall a minimum of three-feet into the varved clay unit, the depth to the base of the barrier will range from approximately 20 to 25 feet below ground surface.

2. A 1,200 linear foot (lf) structural component consisting of a steel sheet pile wall will be installed outboard of the slurry wall along the Hackensack River and connected to the existing 6000 lf steel sheet pile wall at the Seaboard Site. The sheet pile wall will be keyed at least three feet into the varved clay unit, and possibly deeper, if required to provide adequate lateral earth support. The steel sheet pile wall will be constructed with a minimum top elevation of 10 ft-msl. The plan location of the sheet pile wall will be selected to provide for the installation above the mean high water line of the Hackensack River (i.e., 3.1 ft msl). In addition, the steel sheet pile wall will include sealed joints.

Note that the actual location of the barrier wall system will be subject to permitting and access considerations. However, it is expected that the riverside slurry wall and sheet pile wall will be installed as near to the Hackensack River as possible, and, consistent with permit requirements, will be designed to contain impacted groundwater and DNAPL to the maximum extent practicable. It is further assumed that the perimeter slurry wall will be installed as close to the property line as possible given considerations regarding the existence of utility lines and areas of structural concern (e.g., the New Jersey Transit Authority rail line embankment).

Design Requirements:

The proposed barrier wall system will mitigate the potential for migration of DNAPL and impacted groundwater to the Hackensack River surface water and sediments and prevent potential migration of constituents to other offsite areas located to the north, west, and south. The design standards for the proposed barrier wall system are:

- The slurry wall will be located to provide containment needed to achieve the remedial objectives;
- The slurry wall will be keyed a minimum of three feet into the low permeability varved clay unit; the steel sheet pile will be embedded deeper (if required) to provide adequate lateral earth support;
- The slurry wall will be constructed of materials that are chemically compatible with site constituents as verified by a standard mix design assessment;
- The steel sheet pile will be designed to be structurally sound, as dictated by proposed final site surface grades;

- The steel sheet pile wall structural design will address tidal fluctuations, the implications of major storm/flood events (e.g., rapid drawdown conditions) and the proposed excavation of near-shore sediments;
- The barrier wall alignments will be designed to comply with applicable regulatory/permit requirements (such as plan location relative to the mean high water line); and,
- The slurry wall will be designed to achieve a permeability requirement not greater than 1×10^{-7} cm/sec. An appropriate mix must be selected during the design phase.

Design Activities:

Data acquisition activities to support the design of the barrier wall system are proposed in Section 4.1. Design deliverables will consist of detailed design drawings and technical specifications for construction and a Construction Quality Assurance Plan (CQAP). The following aspects of the proposed barrier wall system will be assessed in detail, to ensure that the proposed remedy will fully serve its intended function:

Barrier Wall Materials

The slurry wall excavation will be backfilled with a soil-bentonite mixture. Testing of existing soils (i.e., sands excavated in association with slurry wall construction) and bentonite will be completed to develop the appropriate slurry wall backfill mix. Existing Site DNAPL and groundwater data were reviewed to assess whether the soil-bentonite slurry is compatible with DNAPL and groundwater chemistry. This assessment suggests that the slurry wall backfill should be compatible with Site groundwater COIs. The steel sheet pile wall will be constructed using coated steel panels with sealable interlocking joints. The coated steel is compatible with Site groundwater and DNAPL constituents.

Sheet Pile Interlock Sealing Methods

The steel sheets will be driven as "welded pairs" with sealable interlocks. Joint sealant technology, including installation of water-swelling compounds and grouting, will be assessed for sealing the unwelded steel sheet pile interlocks, to provide compatibility with Site DNAPL and groundwater constituents.

Sheet Pile Wall Structural Design

The target depth of the steel sheet pile barrier wall will be selected to, at a minimum, "key" the wall three feet into the low permeability varved clay unit. This target wall depth may be increased, based upon slope stability analyses and detailed design calculations, to accommodate additional structural design requirements as described below.

The wall depth and steel sheet pile cross section/modulus will be designed to provide adequate structural support, and to accommodate lateral earth pressure resulting from backfill placement behind the wall. The design parameters to be determined will include:

- Wall embedment depth;
- Sheet pile cross section/modulus; and,
- Anchor tie-back configuration (if required).

These detailed structural calculations will utilize Site-specific geotechnical data to be obtained during the aforementioned design data acquisition activities. In particular, the relatively low subgrade support/shear strength of the meadow mat layer will be assessed in detail. Furthermore, vibration analysis is likely to be necessary for the northernmost portion of the steel sheet pile wall. Shoring of the railroad embankment or other comparable methods of protecting the railroad right-of-way may be necessary.

Wall Height

The height of the slurry wall will be the minimum necessary to prevent overtopping of the wall by groundwater from the exterior of the wall. Based on the groundwater modeling results, the top elevation of the slurry wall will be at a minimum of 7 ft-msl. It is likely that working platforms (compacted imported earthen fill) will be necessary around the perimeter of the Sites to accommodate installation of the slurry wall to a consistent final height. The sheet pile wall will extend to an elevation of 10 ft-msl which corresponds to the 100-year flood elevation.

3.2 HYDRAULIC CONTROL SYSTEM

The hydraulic control system will consist of the installation of multiple fill unit groundwater extraction wells and shallow fill and deep sand unit DNAPL recovery wells. A groundwater treatment plant will be constructed to treat the extracted groundwater. Groundwater extraction will be conducted to 1) control groundwater mounding within the fully-enclosing barrier wall system; 2) maintain a water table elevation that will preclude the potential upward migration of hexavalent chromium; 3) provide for an inward hydraulic gradient; and, 4) provide for an upward or neutral hydraulic gradient between the deep sand unit and the fill unit.

Twenty-seven (27) fill unit extraction wells and eight (8) deep sand recovery wells will be installed. Five of the fill unit wells will be DNAPL recovery wells. The deep sand recovery wells will be installed to recover DNAPL, as subsequently discussed.

Based on groundwater modeling completed to date, it is anticipated that pumping of the fill unit wells at 0.5 gallons per minute (gpm) or less each and pumping of the deep sand wells at 0.5 gpm each will be sufficient to exercise the requisite hydraulic control. The wells will be equipped with level switches to maintain the groundwater levels at the desired elevations.

A groundwater treatment plant capable of treating 30 gpm will be constructed. The groundwater treatment plant will consist of a primary DNAPL phase separator, a primary hexavalent chromium chemical reduction unit, and solids, metals, and organics removal polishing units. Treated water will be discharged to the Hackensack River under an NJPDES General Permit.

Description:

Hydraulic control will be implemented to prevent a rise of the water table within the barrier wall enclosure. Numerical groundwater modeling (Appendix A) has demonstrated that an average total combined pumping rate of approximately 8 gpm will be sufficient to maintain the water table at its existing elevations. A total of 35 recovery wells screened in the shallow fill and the deep sand will be used to maintain hydraulic control. Based on evaluation of existing groundwater and DNAPL data, the planned groundwater treatment system will consist of the following:

- Residual DNAPL separation;
- pH control and hexavalent chromium reduction;
- pH control and metals precipitation/flocculation;
- Solids dewatering and management; and,
- Dissolved organics removal via carbon adsorption.

System design and construction will be based on anticipated influent groundwater chemistry, expected discharge limits established pursuant to the NJPDES permitting process, field verification activities, and the required pumping rate from each dewatering and DNAPL recovery area. A proposed layout of the groundwater recovery system based on the groundwater modeling results included as Appendix A (including the DNAPL recovery wells discussed in Section 3.3) is provided as Figure 3-3. A process flow diagram for the groundwater treatment plant is provided as 3-4. Details for a typical shallow groundwater recovery well and the DNAPL recovery wells (shallow and deep) are presented on Figure 3-5.

Upon the completion of the barrier wall installation and installation and initial start-up of the hydraulic control system, the effectiveness of these components of the IRA will be assessed via a hydraulic control monitoring program. Water levels will be measured on a quarterly basis for a period of two years to demonstrate containment. Water levels will be monitored in the wells/piezometers depicted on Figure 3-3 which includes a number of proposed new piezometers.

Design Requirements:

The hydraulic control system and treatment plant must maintain hydraulic control, comply with the final NJPDES permit requirements, and be constructed in accordance with applicable codes and standards. Specific design requirements for the hydraulic control system consist of the following:

- Groundwater COI concentrations will be identified through the collection and analysis of additional groundwater samples to support identification of appropriate treatment approaches;
- General groundwater quality data will be identified through the collection and analysis of additional groundwater samples to identify potential solids settling rates;
- Bench-scale jar testing will be required to identify appropriate reagents and dosing rates for the treatment system;
- Discharge limits will be developed through consultation with the NJDEP and will support identification of appropriate treatment technologies and the sizing of equipment;
- The optimum pumping rate for hydraulic control will be determined through refined modeling that considers the proposed IRA cap configuration and potential infiltration rates. The pumping rates (in part) will be used to develop piping, pump, and equipment specifications; and,
- Pumping well locations will be used to develop requisite piping, pump, and utility requirements.

In addition to the preceding, groundwater recovery and treatment design will incorporate the design information generated for the DNAPL recovery system discussed in Section 3.3.

Design Activities:

Current groundwater quality data will be reviewed and discharge limits will be established through consultation with the NJDEP as documented in an NJPDES permit application to support the groundwater pumping and treatment alternative. The deliverables will consist of detailed design drawings and technical specifications for construction, a Construction Quality Assurance Plan (CQAP), and an NJPDES permit application. The following aspects of the proposed groundwater recovery and treatment system will be assessed in detail:

Treatment Plant Unit Operations

Required process units, pumps, piping, and instrumentation will be selected based on expected influent and effluent concentrations and the planned pumping rate. Process unit coatings and necessary materials will be chemically compatible with the Site-related constituents and the treatment reagents to be used. The units will be oversized to accommodate additional flow from hydraulic control wells or DNAPL recovery location, if required. The process components will have a maximum flow of approximately 30 gpm. Removal calculations have been completed to determine requisite treatment techniques. Solids handling will be incorporated to accommodate solids settling, dewatering, and disposal. Appropriate process control instrumentation will be identified and installed. Process and Instrumentation Diagrams will be prepared.

Treatment Plant Location

Equipment sizing and layout, existing site physical features, the availability of utilities, the location of the recovery wells, the proximity to the receiving surface water body, and stream encroachment considerations will be considered to identify an appropriate treatment plant location. The treatment plant will be located to minimize potential interference with ongoing site maintenance activities, to accommodate ready access for maintenance (e.g., carbon change out), and to minimize piping runs.

Permit Applications

An NJPDES permit will be necessary for this IRA element. Permitting requirements are identified in Section 5.0 of this IRAW.

Discharge Monitoring

Monitoring of effluent concentrations will be conducted as required by the permit. Discharge monitoring and reporting requirements and the outfall location will be identified during the permitting process. An appropriate sample location downstream of the last treatment unit will be identified. Internal system monitoring sample ports will also be incorporated to facilitate evaluations of individual processes (e.g., between carbon units) on an as-needed basis.

Piping and Conduit

Hydraulic calculations will be performed, based upon anticipated groundwater extraction rates, to determine the size of the pipes to convey the extracted groundwater to the treatment plant. Conveyance piping will consist of high density polyethylene, which is chemically compatible with the groundwater constituents. Conduit will be installed to provide power to the wellheads.

A piping layout from the recovery wells to the treatment plant is shown on Figure 3-3. Piping and conduit will be installed to avoid existing structures. Piping will be installed at a depth designed to limit frost effects and will be heat-traced and insulated where above ground. Various piping materials (e.g., steel, high density polyethylene, polyvinyl chloride) will be used within the treatment plant contingent upon their location within the treatment train.

Pumps

The groundwater extraction pumps will be sized based on the anticipated flow rate and required discharge head. Submersible pumps compatible with the Site constituents will be installed. Transfer pumps and precipitate material pumps will be sized for the flow rates and materials to be generated.

Power Distribution and System Controls

Power supply and distribution will be adequate to accommodate well pumps and process system requirements. Power will be supplied in 480 volts single phase and distributed at the voltage and amperage requirements for the requirements of each motor, process equipment, instrumentation, and utility. The groundwater recovery and DNAPL recovery wells will incorporate conductivity switches to prevent pumping the extraction wells dry and to maintain the water levels at the desired elevations.

Materials Management

Treatment plant material management procedures will be developed in detail through the permitting process. In general, RCRA characteristic and TCLP testing will be completed to determine the RCRA waste classification and off-site treatment/disposal options. It is planned that any DNAPL generated via separation will be conveyed to DNAPL storage containers associated with the DNAPL recovery wells and will ultimately be recycled or incinerated off site. It is expected that metals removal-related solids will be landfilled offsite and that the activated carbon will be thermally regenerated. Cuttings from well drilling will be consolidated onsite in an AOC or disposed off site per the materials management decision flowchart (Figure 1-3) and in accordance with all applicable rules and regulations.

3.3 DNAPL RECOVERY SYSTEM

This aspect of the planned IRA consists of installation of an active system to recover DNAPL from the shallow fill unit and the deeper sand unit at the SCCC Site. Although DNAPL recovery is not necessarily required in connection with the installation of the barrier wall containment system, the Group acknowledges that a recovery system will be necessary to accomplish the long-term objective of DNAPL removal to the maximum extent practicable. The Group is in agreement with the NJDEP that sufficient information currently exists for design and construction of a DNAPL recovery system. Consequently, the Group proposes to construct the DNAPL recovery system in conjunction with the IRA. The DNAPL recovery system will also be a component of overall hydraulic control for the site. Recovered DNAPL will be recycled or treated/disposed off site, and groundwater recovered during the pumping operations will be treated in the onsite treatment plant and discharged to the Hackensack River pursuant to an NJPDES permit.

Description:

Active DNAPL recovery will be implemented in both the shallow fill unit and deeper sand unit on the SCCC Site. The proposed DNAPL recovery system will consist of a series of collection units that combine features of a well and a sump from which groundwater will be extracted to enhance the recovery of DNAPL.

To optimize the DNAPL recovery, the collection units will be installed near DNAPL "entry zones", such as the lagoon and Building 4 areas and low-lying areas in the upper surface of basal confining units where the DNAPL has pooled. The design of the collection units will allow for effective in-well physical separation of groundwater and DNAPL. DNAPL that enters the well will separate by gravity and will accumulate in a solid-walled sump at the base of the well. Groundwater extracted in conjunction with DNAPL recovery will be treated on site and discharged to the Hackensack River.

The recovered DNAPL will be recycled or disposed off site as appropriate. DNAPL recovery well locations are depicted on the hydraulic control plan view (Figure 3-3). Details regarding the planned construction of the DNAPL recovery wells are depicted on Figure 3-5.

Design Requirements:

Design requirements for the DNAPL recovery system are as follows:

- The selection of DNAPL recovery locations considered the historical process area locations, RI data relative to DNAPL occurrence, and confining unit configurations;
- The DNAPL collection well screens and filter packs and associated recovery system components must be designed to be compatible with the DNAPL constituents and to optimize the in-well physical separation of groundwater and DNAPL; and,
- The collection units should be designed to provide sufficient storage capacity to facilitate periodic removal of DNAPL from the unit.

Design Activities:

The deliverables will consist of detailed design drawings and technical specifications for construction and a Construction Quality Assurance Plan (CQAP). The following aspects of the proposed DNAPL recovery system will be assessed in detail, to ensure that the proposed remedy will fully serve its intended function:

DNAPL Recovery Locations

DNAPL distribution data and geologic information have been reviewed in detail to determine the optimum locations to conduct DNAPL recovery. Recovery areas consist of DNAPL entry zones, topographically low areas in the upper surface of the confining units that may be indicative of potential areas of "pooled" DNAPL, and existing monitoring wells in which a significant thickness of DNAPL has accumulated.

DNAPL Recovery Well Construction

Considerations for the design of the DNAPL recovery components include sizing of the recovery well and sump diameters and screen slot size selection to promote the effective in-situ physical separation of DNAPL and groundwater. Filter pack sizing and grading specifications will be developed to prevent sediment accumulation within the wells. The screen slot size and sump diameter will be selected to promote physical separation of groundwater and DNAPL within the collection unit. Construction materials will be evaluated to ensure that they are chemically compatible with DNAPL constituents. Sump length and diameter will be selected to provide sufficient storage capacity to optimize operations and maintenance resources.

Piping

Hydraulic calculations will be performed, based upon anticipated groundwater extraction rates, to determine the required size of the pipes to convey the extracted groundwater to the treatment plant. Materials will be evaluated to verify that they are chemically compatible with the groundwater constituents.

Pumps

The groundwater extraction pumps will be sized based on the anticipated flow rate and required discharge head for each sump. Low-power submersible pumps compatible with the Site constituents will be specified.

Power Distribution and System Controls

Power distribution requirements will be addressed in the design. The design will incorporate system controls to prevent pumping the extraction well dry, accumulation of DNAPL above the rim of the sump, and to maintain the water levels at the desired elevations.

3.4 LAGOON DEWATERING AND BACKFILLING

The planned IRA for the SCCC lagoons has been developed based on the consideration of multiple objectives, as follows:

- Attainment of the Site Remedial Action Objectives as described in Section 1.2 of this IRAW;
- Consideration of NJDEP comments regarding a readily implementable alternative for the lagoons;
- Consideration of EPA comments regarding consolidation of materials in Areas of Contamination; and,

- Identification of a readily implementable remedy that could accommodate further characterization and completion of a different final remedy.

The following specific requirements were considered to develop an appropriate interim response for the lagoons:

- The planned IRA should eliminate the potential for subsurface discharge of constituents to the Hackensack River;
- The planned IRA should remove DNAPL to the extent practicable as a source control measure and should eliminate the potential for direct contact with constituents;
- The planned IRA should eliminate the potential for overland runoff of constituents to the Hackensack River;
- The planned IRA must be a remedy that can be "supported by available information and can be implemented";
- The planned IRA cannot be "contingent upon the results of pre-design investigations and treatability studies that may or may not support and/or allow for implementation";
- The planned IRA should ensure "that the locations for consolidation contain similar contaminants and concentrations as the materials that are being consolidated"; and,
- The planned IRA should allow for flexibility during the development of a final remedy such that alternative remedies may ultimately be selected for the lagoons.

Note that several alternative options were considered for the lagoons and were found to be inappropriate based on consideration of compliance with the foregoing requirements. A summary of the alternatives that were evaluated and have been excluded from consideration, and the rationale for their exclusion, is as follows:

Onsite Consolidation in an Alternate Location Under an Interim Surface Cover

This alternative was evaluated because the NJDEP had mentioned it as a potentially applicable approach in previous discussions with Group representatives. This potential option was excluded from consideration in view of potential short-term risks associated with exposure to the material during relocation. In addition, this alternative provides no additional benefit in terms of protectiveness because the fully-enclosing perimeter barrier wall will isolate the lagoon contents from potential off-site receptors. This alternative is also not implementable based on the EPA requirement that locations for consolidation should contain similar contaminants and concentrations as the materials that are being consolidated. No such potential consolidation areas exist on the SCCC Site.

Excavation and Offsite Transportation and Disposal

This potential option was excluded from consideration as an interim response based on the absence of waste classification data to determine the nature of the lagoon solids and hence potential disposal options. This alternative cannot be "supported by available information". Viable offsite disposal facilities cannot be identified at the current time. However, the data needed to evaluate this option as a final remedy will be obtained as described in Section 4.4. Preliminary inquiries into the viability of the off-site disposal of this material indicates that even when the additional information is available, it will be very difficult to find facilities that are legally able and willing to accept the material for treatment and/or disposal.

In-situ Solidification of the Lagoon Solids

This potential option was excluded from consideration as an interim response based on the absence of treatability study data that demonstrates the effectiveness of a potential solidification remedy. This alternative cannot be "supported by available information". However, treatability studies will be conducted to assess solidification as part of the planned RI.

Based on the requirements previously outlined, dewatering, backfilling, and installation of an interim surface cover are planned as the IRA for the lagoons. This alternative, in concert with other components of the planned IRA, satisfies all of the foregoing requirements. Specifically, this alternative, combined with other IRA components will achieve the following:

- The planned IRA will eliminate the potential for subsurface discharge of constituents to the Hackensack River via the installation of the fully enclosing barrier wall and installation of the groundwater extraction and treatment system. Furthermore, dewatering of the lagoons will serve to reduce the potential for leachate generation and hence will mitigate the potential for ongoing subsurface impacts.
- The planned IRA will remove DNAPL to the extent practicable via the installation of DNAPL recovery wells, many of which will be located in the immediate vicinity of the lagoons. The planned IRA for the lagoons will also eliminate the potential for direct contact as a result of the installation of an interim surface cover.
- The planned IRA will eliminate the potential for overland runoff of constituents to the Hackensack River. Installation of the barrier wall system will limit flooding of the Site. Installation of the interim cover will also serve to mitigate the potential for offsite migration of constituents via overland runoff.
- The planned IRA can be accomplished using existing site data and requires the use of readily implementable technologies that can be accomplished in a timely manner with readily available equipment.

- The planned IRA does not require the collection of additional investigative data to support implementation. Furthermore, it does not require the completion of any treatability studies to determine if it is technically viable.
- The planned IRA does not create a potential short-term risk due to the potential for exposure to the material during construction as would result from the relocation of the lagoon solids to other areas of the site. Contingent upon material management decisions as outlined on Figure 1-3, the lagoons may be an appropriate consolidation location for river sediments and ditch soft soils given that these media contain similar constituents at concentrations lower than those that currently exist in the lagoons.
- The planned IRA includes of the installation of backfill materials that will be vertically segregated from the lagoon solids. Vertical segregation of the lagoon solids and the backfill materials will accommodate implementation of an alternate option as part of the final remedy at a later date.

As indicated, it is planned that the lagoons will be dewatered and capped with an interim surface cover to eliminate potential direct contact exposure and to control the potential for overland runoff. Other IRA components will address other objectives such as isolation from the river and source removal. Dewatering of the lagoon will be completed as the first phase of the lagoon preparation. Surface water from the lagoon will be treated in temporary treatment equipment mobilized to the Site. Given the variability in the water volume observed in the lagoons as a result of seasonal effects, this activity will likely be completed in the dry summer months. Upon completion of dewatering, the lagoon will be backfilled to meet the surrounding grade using successive lifts of either clean borrow material, or excavated river sediment. Geogrids will be used as necessary to provide tensile strength in areas of poor subgrade support, although Site inspections have shown that only a few portions of the lagoon contain soft materials. Samples of the lagoon contents will be obtained once dewatering is completed to support waste classification.

Description:

The lagoon contents (approximately 7,300 cubic yards) at the SCCC Site will be capped in place. The cap will be installed as an IRA while additional potential final remedial alternatives are evaluated for the lagoon contents. Potential alternatives for the final remedy consist of the following: 1) final capping (which could consist of the interim cap); 2) solidification and capping; and, 3) excavation and offsite treatment and/or disposal. As part of future RI activities, the Group will conduct a solidification treatability study and utilize the NJDEP waste classification determination to identify disposal facilities that are able and willing to accept dioxin-impacted materials for treatment/disposal.

Dewatering of the lagoon will be necessary prior to implementation of backfilling and capping. Upon completion of dewatering, the lagoon contents will be covered via backfilling with clean borrow material or Site target materials such as south ditch and/or Hackensack River near-shore

sediments, contingent upon material management decisions (Figure 1-3). Conditioned target material (near-shore river sediments and/or drainage ditch soft soils) or clean borrow material will be placed in successive lifts incorporating geogrids for tensile strength as necessary. It is planned that geogrid material will be placed as necessary on any soft areas in the existing solids and a lift of granular borrow material will be placed in these areas to establish a stable working surface. The geogrid will extend up the side walls of the lagoon and onto the surrounding soils and/or onto adjacent hard spots in the lagoon as appropriate. A geotextile fabric will then be placed as a demarcation layer between the lagoon solids and the backfill materials. Successive lifts will consist of either borrow or site target materials conditioned to take up moisture. Based on volume estimation, and contingent upon material management decision outcomes, it is planned that the south ditch soft soils will be placed in the west lagoon. These sediments will be covered with an additional geotextile, and the river sediments will be placed in the east lagoon and in the remaining air space in the west lagoon. Additional geogrid materials will be placed as necessary to provide tensile strength to stabilize the lagoon backfill. Proposed details regarding the lagoon backfilling are shown on Figure 3-6. Details regarding the interim surface cover, which will extend over the lagoon, are provided in Section 3.6.

Design Requirements:

Design requirements that must be satisfied to support dewatering, backfilling, and capping of the lagoons are as follows:

- Current lagoon surface water quality data will be necessary to support specification of a temporary treatment system;
- It is anticipated that the treated water will be discharged pursuant to a general NJPDES permit. The temporary treatment system will be designed to attain discharge standards that will be identified as part of the design process in consultation with NJDEP;
- The volume of water present in the lagoons may dictate sizing of treatment equipment contingent upon the time required for treatment of the surface water;
- The available freeboard in the lagoons must be determined to identify the volume of material required for backfilling; and,
- The compressibility of the meadow mat beneath the lagoons requires the collection of additional geotechnical data necessary for design of the lagoon cover system.

Design Activities:

The deliverables will consist of detailed design drawings and technical specifications for construction and a Construction Quality Assurance Plan (CQAP). The following aspects of the

proposed lagoon dewatering and backfilling will be assessed in detail, to ensure that the proposed remedy will fully serve its intended function:

Water Volume Estimation

The quantity of surface water present in the lagoons may dictate sizing of treatment equipment contingent upon the temporal requirements for lagoon dewatering. Reasonable estimates of potential water content will be developed based on inspection of the lagoon during the course of the design phase, and via consideration of the potential impacts of seasonal rainfall events.

Freeboard Evaluation

Existing site topographic information and elevation data for the lagoon solids surfaces generated during historical investigation of the lagoons will be considered to identify the available freeboard in the lagoons. Coupled with development of the final grading plan for the lagoon area, this information will be used to specify the minimum fill requirements for the lagoons.

Settlement Evaluation

Geotechnical data will be necessary to determine potential settlement of the geologic units beneath the lagoon and surrounding area as a result of backfilling. Soil borings will be completed around the lagoon perimeter to provide the geotechnical data necessary to complete the settlement analysis.

Treatment Plant Specifications

A temporary treatment plant will be used to treat lagoon surface water prior to discharge to the Hackensack River. The hydraulic control treatment plant will be capable of treating the water from the lagoons and may be used in lieu of a temporary plant. The quality of the lagoon surface water and anticipated discharge limits will be considered during treatment plant design. Surface water samples will be obtained to support this activity.

Geogrid Evaluation

A geogrid material will be specified based upon an evaluation of the lagoon solids. Upon the completion of dewatering operations, any potential soft locations will be identified via probing and final locations for geogrid placement will be specified in the field.

Base Course Evaluation

Suitable borrow material will be identified for inclusion as the first backfill lift in the lagoon. The need for inclusion of a geogrid within the base course (contingent upon the subgrade support of the underlying materials) will also be evaluated.

Dust Control

Although the lagoon solids are expected to be moist, backfill materials will be relatively dry and specification of dust control measures may become necessary for the backfilling operations. During backfilling, dust monitoring will be performed and control measures will be used as necessary and will be considered during generation of specifications for the final design.

3.5 NEAR-SHORE SEDIMENT MANAGEMENT

This component includes removal of river sediments located within 50 feet of the proposed Barrier Wall at the SCCC and Diamond Sites. Although sediment removal is not necessarily required as IRA, the Group acknowledges that some sediment removal may be necessary to accomplish the remedial objective of minimizing potential impacts to the Hackensack River. Consequently, the Group proposes to remove near-shore sediments in conjunction with the IRA. Removed sediments will be conditioned as necessary and will be managed in accordance with the materials management decision flow chart (Figure 1-3). Any material to be consolidated on site (either as a result of AOC Policy approval or a non-hazardous waste classification) will be used as backfill for the lagoons and contained beneath an interim surface cover (Section 3.6). Conditioning of the sediments will be performed to reduce moisture and increase structural strength properties for either onsite use or offsite disposal. Waste classification efforts will be necessary to support the evaluation of the management options for the sediment.

Description:

Following installation of the barrier wall, near-shore Hackensack River sediments that are potentially impacted with site-related constituents will be removed, conditioned (dewatered/solidified), and either consolidated onsite, treated/disposed offsite, or a combination thereof, as previously discussed. A conditioning study to identify the required additives for dewatering and solidification will be performed during the design data acquisition activities (Section 4.5). As shown on Figure 3-1, sediment located within 50 feet of the proposed barrier wall alignment and to a maximum depth of 3 feet below the sediment surface or until the meadow mat is encountered (if less than 3 feet) will be removed and consolidated and/or treated and disposed.

Given the presence of dioxin congeners in the river sediments, it is tentatively planned that the sediments will be consolidated in the vicinity of the SCCC lagoons because that area also contains dioxin congener-containing materials. Placement of the materials in this location will be contingent upon waste classification and AOC Policy considerations as previously shown in Figure 1-3. Prior to consolidation (or shipment), sediment will be dewatered and conditioned as necessary. Materials to be managed on site (if any) will be placed on site beneath an interim surface cover in the lagoon area. Following removal of the sediments, the shoreline and river bed will be restored.

Design Requirements:

Design requirements for the onsite consolidation of river sediments are:

- Conduct pre-excavation sampling and analysis to support a waste classification determination;
- In the event that the use of the AOC Policy is not approved, identify those portions of the river sediments that are hazardous and therefore not suitable for onsite consolidation;
- Designate an area or areas within the interim surface cover area (Section 3.2.1) as suitable for sediment consolidation;
- Identify backfilling, restoration, and mitigation specifications as necessary;
- Identify dewatering and water management requirements (if any); and,
- Designate performance requirements such that the conditioned and placed sediments have adequate strength to support the interim surface cover component of the response action.

Design Activities:

Following collection of the design data, design of the sediment remediation activities will be performed. Sediment remediation will be coordinated with other aspects of the IRA to ensure that adequate access to the sediments is available. In addition, the logistics of sediment management will be considered in view of other ongoing, completed, or planned responses. The following aspects of the proposed river sediment removal and consolidation/disposal efforts will be assessed in detail, to ensure the proposed remedy will fully serve its intended function:

Volume Estimation

This design element will consist of: 1) estimating the in-place volume of the sediments to be removed; 2) estimation of the volume of the dewatered sediments (expected to be smaller in volume than the in-place sediments); and, 3) estimation of the final volume of the sediments upon completion of any requisite conditioning.

Sediment Dewatering

This aspect of the design will consist of identification of an appropriate means of dewatering the sediments. Gravity dewatering or mechanical dewatering may be conducted although the preferred approach will be to take up the excess moisture via addition of conditioning agents.

Sediment Stockpiling

This aspect of the design will include identification of an appropriate location for sediment stockpiling prior to placement, under the proposed cover, as appropriate based on the materials management decision flow chart (Figure 1-3). A stockpile location that will not impede other site operations will be identified. In addition, a location where potential runoff from the stockpile can be easily controlled will be identified and an erosion and sediment control plan for the stockpile will be developed.

Sediment Conditioning

Conditioning of the sediment may be required to meet structural requirements for emplacement of the interim cover or for shipment (i.e., to meet the paint filter liquids test). Addition of Portland cement or other binding agents will likely be used to condition the sediments.

Sediment Placement

The design will include identification of appropriate areas for placement of the river sediment contingent upon waste classification and AOC Policy status (Figure 1-3) and volume estimation. The SCCC lagoon will be covered as an interim measure and this area is considered an appropriate location for the excavated river sediments as well as the south ditch soft soils given the presence of dioxin congeners in all of these materials. The required lifts and compaction requirements will be identified during the design process.

Restoration Requirements

Upon completion of the river sediment removal, restoration activities will be completed to restore the sediment bed to the extent practicable and to restore any disturbed areas of the shoreline. Sediment bed restoration will be designed based on a pre-excavation inspection of the area to identify the types of habitat present along each reach of interest (e.g., tidal mud flats). Specific restoration requirements will be established through the permitting process.

Permit Applications

This design element will consist of the preparation of all required Federal, State, and local permits applications. The required permits are identified in Section 5.0 of this IRAW.

Wetland Mitigation Plan

A wetland mitigation plan will be prepared that addresses replacement of the ecological and functional value of any intertidal wetlands, freshwater wetlands, and shallow water habitat that may be disturbed during the river sediment removal and placement action. This plan will be submitted to the ACOE, NJDEP LURP, NJMC and the Meadowlands Interagency Mitigation Advisory Committee (MIMAC) for approval.

In addition to the preceding design elements, permitting of the river sediment remediation may entail the preparation of long-term inspection and monitoring plans for both the sediment placement area and the restored sediments. The need for these plans will be identified during the course of the design and permitting process and will be developed as appropriate. These aspects of monitoring and inspection may be incorporated into a universal site inspection and monitoring plan if feasible.

3.6 INTERIM SURFACE COVER AND STORM WATER MANAGEMENT SYSTEM

This component entails construction of an interim surface cover over portions of the SCCC and Diamond Sites. The interim surface cover will be designed to achieve the following: 1) eliminate potential direct contact exposure to impacted soil; 2) mitigate the potential upward migration of hexavalent chromium from the COPR soils; and, 3) reduce the potential for overland runoff of sorbed and dissolved constituents to surface water. The final grading for the interim surface cover will be determined during the detailed design. Fill placement will only occur to the extent necessary to accomplish the preceding objectives. The existing IRM covers on the Diamond Site and portions of the SCCC will be maintained.

Description:

As shown on Figure 3-1, an interim surface cover will be constructed over portions of the SCCC and Diamond Sites. The proposed surface covers will be comprised of a one-foot thick layer of coarse aggregate underlain by a geotextile fabric. The primary reasons that the interim surface cover is necessary are as follows:

- Elimination of potential direct contact exposure to impacted soil;
- Mitigation of the potential upward migration of hexavalent chromium from the COPR soils; and,
- Reduction of overland runoff of sorbed and dissolved constituents to surface water.

Note that the interim surface cover will act as a protective engineered barrier for materials consolidated on site in accordance with the AOC policy if concurrence with the AOC Policy request is obtained as previously described in Figure 1-3. In the event that such concurrence is not obtained, characteristic hazardous waste will be disposed off site while non-characteristic materials will be consolidated on site beneath the surface cover.

As part of the interim surface cover, the existing stormwater management system will be improved to accommodate the remediation project by retrofitting as required the existing storm sewer between the Diamond Site and the SCCC Site, installing a new storm sewer system along the alignment of the existing ditch at the SCCC Site, and remediating and backfilling the existing south ditch on the SCCC Site. The new storm sewer system will be comprised of:

- A network of catch basins and headwalls (i.e., inlets);
- HDPE conveyance piping; and,
- One or more outfalls to the Hackensack River.

It is currently planned that the new stormwater management system will be comprised of two 2-foot diameter smooth-bore HDPE culverts. The joints will be butt-fused, to preclude groundwater infiltration in areas where the invert of the pipe may lie below the depressed water table.

Design Requirements:

The interim surface cover will be designed to achieve the following remediation objectives:

- Prevent potential direct exposure to impacted surface soils;
- Control the potential upward migration of hexavalent chromium from the COPR-impacted soils;
- Maintain existing storm water flow patterns;
- Provide site protection from flooding during peak storm events; and,
- Provide an engineering control over consolidated materials.

The specific performance standards that will be considered in the interim surface cover design are as follows:

- The interim surface cover will provide an engineering control to mitigate the potential for direct contact with impacted soil;
- The interim surface cover will serve as a capillary break to prevent the potential upward migration of hexavalent chromium from the areas of the Diamond and SCCC Sites containing COPR soil; and,
- The surface cover will be designed to accommodate potential settlement of the underlying meadow mat and/or lagoon contents to minimize the potential for ponding.

Design Activities:

Data acquisition activities, to support the design of the interim surface cover are proposed in Section 4.1.1.1. Design of the interim surface cover component will be completed following the completion of the aforementioned design data acquisition activities. The design deliverables will be comprised of detailed design drawings, technical specifications and a Construction Quality

Assurance Plan (CQAP). The following aspects of the proposed interim surface cover will be assessed in detail, to ensure that the proposed remedy will fully serve its intended function:

Grading Plan

An initial design task will be preparation of a surface grading plan for both Sites. At a minimum, revised surface grades will be developed for areas proposed to receive an interim surface cover. The grades will be designed to provide for positive drainage and to provide sufficient capacity between the existing and proposed grades to accommodate the volume of backfill materials (e.g., slurry wall spoils, drainage ditch soft soils, borrow material, etc.) resulting from development of the on-site consolidation areas, if utilized. In addition, minor surface regrading may be completed to augment drainage toward the inlets of the proposed culvert system to be installed in the remediated/backfilled drainage ditch along the southern boundary of the SCCC Site. Finally, the grading plan will reflect the surface grades of the working platform to be constructed in association with installation of the slurry wall. Provisions for site ingress and egress (such as access ramps) will also be included as required.

Layer Specifications

Interim surface cover components will be designed and specifications will be developed to ensure that the Remediation Objectives and Performance Requirements are achieved. As previously explained, the capillary break layer will be comprised of coarse aggregate underlain by geotextile fabric. Several considerations will be incorporated into the selection of these components, including:

- Capillary break function;
- Physical separation of the underlying soils from the cover system materials; and,
- Accommodation of existing site features, including asphaltic concrete pavement.

Settlement Analyses

Compressible subsurface layers (meadow mat) and cohesive soils prone to secondary consolidation (varved clays) are known to exist at the sites. In conjunction with the development of a final grading plan for the consolidation area on the SCCC site, an evaluation of settlement will be performed.

Storm Water Management Calculations

As previously discussed, the existing drainage ditch located along the southern boundary of the SCCC Site will be remediated and backfilled, in preparation for installation of the proposed slurry wall working platform. Discharge rates through the existing ditch are generally constrained by the culvert/tide valve structure located at the outfall of the ditch, adjacent to the Hackensack River. The new culvert system will be sized to, at a minimum, pass the peak discharge provided by the existing system.

Erosion, Sediment, and Dust Control

Temporary measures to control erosion, sediment and dust during land disturbance will be incorporated into the design. These measures may include sediment barriers or traps as required to comply with applicable standards.

3.7 SITE PREPARATION ACTIVITIES

In addition to the preceding principal components, other tasks must be performed to prepare the Site for construction of the aforementioned IRA components. These tasks consist of a number of straightforward elements such as security controls, well installation, well refurbishment, and utility protection, relocation or abandonment. In addition, site preparation includes a number of response actions, as follows:

- former process area tank removal;
- former process area tank saddle removal;
- septic tank removal;
- stormwater system repair or replacement;
- transformer pad removal;
- ditch soft soil remediation; and,
- vault contents management.

Description:

Site preparation includes a wide range of activities that are necessary to prepare the Sites for construction of the IRA. The Site preparation component is comprised of specific and relatively straightforward elements. As such, only a brief discussion of each element is provided in this IRAW. Implementation plans for each element will be developed, as appropriate, as part of the IRA design for construction.

- ***Engineering and Administrative Controls:*** Engineering controls such as fencing, security, and hazard communication will be implemented as part of the response action.
- ***Monitoring Well/Piezometer Installation and Refurbishment:*** Upon completion of a detailed design for the interim surface cover and development of the groundwater monitoring programs, a plan to install, abandon, and/or refurbish (e.g., extend) groundwater monitoring wells will be developed.
- ***SCCC Containerized Materials:*** Various materials requiring management have been containerized and are stored at the SCCC Site. If possible, based on the availability of viable off-site disposal options, these materials will be disposed off site as part of the IRA. If materials cannot be disposed off site, a specific proposal to consolidate

these materials on site beneath a final surface cover will be provided to the NJDEP as part of the final remedy.

- **SCCC Septic Tanks:** The SCCC Site reportedly has two (2) former septic tanks. As part of site preparation, the septic tanks will be decommissioned appropriately, in accordance with N.J.A.C. 7:9A-12.8 and local requirements. Tank contents will be sampled and recovered for offsite disposal. The tanks will then be removed and disposed off site. Confirmatory soil sampling and analysis will be completed.
- **Storm Sewer:** The storm sewer between the SCCC and Diamond Sites will be retrofitted as appropriate in conjunction with the development of a comprehensive storm water management system for the Sites.
- **SCCC Transformer Pad:** The SCCC Site has a concrete pad requiring remediation for PCBs. The concrete pad will be ultimately be removed in its entirety and disposed off site. Confirmation soil samples will be collected from the area beneath the pad following its removal. Samples will be collected for PCB analysis at a sample frequency of 1 PCB sample per 900 square feet (sf) in accordance with the sample frequency outlined in N.J.A.C. 7:26E-3.9(b)ii. If the confirmatory sampling indicates that additional delineation is required underneath the pad, then additional sampling and analysis will be completed. These activities will be completed after the IRA designs are finalized.
- **SCCC Ditch Soft Soils:** The existing ditch on the southern boundary of the SCCC Site contains soft soils that will be excavated and managed either off site or on site (per the decision flowchart provided as Figure 1-3) to accommodate installation of the slurry wall and stormwater controls.
- **SCCC Vault Contents:** The vault contents consist of approximately 600 gallons of viscous petroleum-based non-aqueous phase liquid contained within a small and shallow below-grade concrete vault in the central portion of the SCCC Site. The material has been characterized and a Waste Classification Request Form (HWM-009) was submitted to the NJDEP on October 25, 2006. To date, the NJDEP has not acted upon this waste classification request. Following the receipt of the waste classification determination from the NJDEP, arrangements will be made for the offsite disposal of the vault contents. Following removal of the contents, the vault will be backfilled with clean fill.
- **Utility Protection, Relocation, or Abandonment:** Utilities will be protected, relocated or abandoned as appropriate during implementation of the IRA.
- **Clearing and Grubbing:** Prior to construction of the cover system, appropriate portions of the Sites will be cleared and grubbed to prepare the Site for cover installation.

- ***Access Road Improvement and Construction:*** Access roads will be constructed as needed to facilitate implementation of the IRA.
- ***Maintenance of Function of Existing IRMs:*** Existing IRMs must be maintained throughout the investigation and remediation of the sites to minimize airborne release of hexavalent chromium and volatile organics substances to the atmosphere.

Design Requirements:

The site preparation component of the response will be designed to be consistent with the proposed interim response actions at the Sites.

Design Activities:

Design activities will include the following tasks:

- Prepare a Construction Quality Assurance Plan (CQAP) for site preparation activities;
- Determine final disposal requirements for contents of the septic tanks and for the transformer pad;
- Prepare an Erosion and Sediment Control Plan;
- Prepare a Well Protection, Abandonment, or Refurbishment Plan;
- Determine need for installation/repair of security fencing;
- Prepare a Transportation Plan acceptable to the NJMC that identifies construction, hauling, and general traffic flow on the property;
- Determine utility needs and prepare a utility abandonment or upgrade plan;
- Prepare health and safety protocols to be followed during implementation of the remedy;
- Obtain a jurisdictional determination for the delineated wetlands on the Sites. A map showing the results of the recent wetland delineation performed by Princeton Hydro LLC is included in Appendix B;
- Prepare applications and obtain necessary permits identified in Section 5.0; and,
- Confirm by field survey the property boundaries and prepare an existing conditions site plan.

RESPONSES TO NOV ISSUES

ISSUE NUMBER 1

Requirement: Pursuant to paragraphs 30, 31, and 48 of the Administrative Consent Order executed on October 20, 1989 between the Department and Standard Chlorine Chemical Company, Inc. (Responsible Party), and pursuant to paragraphs 26, 27 and 44 of the Administrative Consent Order executed on April 17, 1990 between the Department and Tierra Solutions, Inc. (Responsible Party), within forty-five (45) days after receipt of the Department's written comments on the Interim Response Action Workplan (IRAW) submit a modified IRAW that complies with said comments and the requirements of N.J.A.C. 7:26E.

Description of Noncompliance: Failure to submit an IRAW that conforms to the Department's comments and which complies with the specified format as per N.J.A.C. 7:26E.

RESPONSE TO ISSUE NUMBER 1

A good faith effort was made to fully respond to all of the Department's comments contained within the Notice of Deficiency. It is anticipated that the proposed revisions to the IRAW as presented herein will adequately address all of the Department's comments.

Although N.J.A.C. 7:26E does not specify a format for an Interim Remedial Action Workplan, the IRAW was prepared to address all relevant components of N.J.A.C. 7:26E. In addition, a cross-reference table was provided that indicates the location of all pertinent components.

ISSUE NUMBER 2

Requirement: Pursuant to N.J.A.C. 7:26E.5.l(c)1, select a remedial action which is protective of public health and the environment.

Description of Noncompliance: The IRAW proposes the consolidation of "Site Target Materials" including; contaminated near-shore sediments, south ditch soft soils/sediment, and trench/barrier wall spoils within an Area of Contamination (AOC) as per USEPA policy. At NJDEP's request; the USEPA has reviewed and provided comments/guidance to the Department regarding the Responsible Parties proposal to utilize the AOC policy as part of this interim remedial action. Furthermore, the NJDEP has incorporated USEPA's comments/guidance into previous correspondence that requires that the Responsible Parties demonstrate consistency with the AOC policy as a prerequisite to receiving NJDEP's approval of the IRAW. Accordingly; the NJDEP has attached a copy of USEPA's August 16, 2007 "email" comments on the Responsible Parties June 22, 2007 "Response to EPA Comments". Within its August 16, 2007 "email", USEPA concludes that the AOC proposal "generally conforms to available guidance". However, the USEPA recommends that,

*Ben Truitt
Set the table?*

contaminant types not be consolidated within areas where they do not currently exist. This recommendation is consistent with NJDEP policy regarding the placement/movement of contaminated materials on-site as part of the remedial action. Therefore, the Responsible Parties must demonstrate to the satisfaction of the NJDEP that the "Target Materials" do not contain contaminants that are significantly different than contaminants contained within the proposed consolidation area within the AOC. Specifically, the IRAW must clearly identify and compare (both in the narrative and in figures) the contaminants and concentrations within both the "Target Materials" and the AOC. If it is determined that the "Target Materials" contain contaminants that are not presently located within the proposed AOC, then these materials may not be consolidated and capped within these areas. Therefore, the revised IRAW must adequately address the comments provided by US EPA within their August 16, 2007 email.

minor Significant Contaminant

RESPONSE TO ISSUE NUMBER 2

It is proposed that new figures and text be added to the IRAW to address this comment. Section 1.3 (Interim Response Action Objectives) includes the first discussion of the proposed utilization of the AOC Policy and the Materials Management Decision Flowchart. This text will be expanded to include a description of all of the materials to be managed, the potential consolidation areas for the materials, the constituents and concentrations present in the materials, and the constituents and concentrations in the potential consolidation areas. Figures displaying the target material areas, potential consolidation areas, and "tags" with concentration data will be prepared and referenced in this section. These figures have been prepared and are attached for NJDEP review. The following figures are provided:

- Figure 1-5 - Diamond Site Barrier Wall Alignment and Proposed Consolidation Area Soil Sample Analytical Results (mg/kg);
- Figure 1-6 - SCCC Site Proposed Consolidation Area Soil Sample Analytical Results (mg/kg);
- Figure 1-7 - SCCC Site Proposed Consolidation Area Groundwater Sample Analytical Results (ug/L);
- Figure 1-8 - South Ditch/Barrier Wall Alignment Sediment/Soil Sample Analytical Results (mg/kg);
- Figure 1-9 - Near-Shore Hackensack River Sediment Sample Analytical Results (mg/kg).

*If so, what are the results?
were samples split?
were they taken in accordance?
an approved APP?*

As shown on these figures, constituents/concentrations are comparable in the various target materials and in the consolidation areas for the two sites. A relatively detailed discussion of the results, which will be included in the revised IRAW, is provided in the remainder of this response. The proposed text revisions are attached for NJDEP review.

Diamond Site Target Materials and Consolidation Area Chemical Composition

Figure 1-5 displays soil analytical data for specific AOC locations of interest for the former Diamond Site (i.e., the planned barrier wall alignment and the proposed Diamond Site consolidation area). Only analytical results which exceed their corresponding NJDEP

residential or nonresidential direct contact or impact to groundwater soil cleanup criteria are depicted on Figure 1-5.

Constituents which exceed the soil cleanup criteria are shown because soil cleanup criteria exceedance is considered a reasonable measure of whether the material is, in fact, impacted. Un-impacted materials are not considered to be of interest for the purposes of completing a similarity comparison (i.e., for addressing the "significantly different" issue).

As shown on Figure 1-5, the primary constituents of interest for the Diamond Site are metals and polynuclear aromatic hydrocarbons (PAHs). PAHs were sporadically detected in soil samples, and when detected, were found to be present only at concentrations slightly in excess of the nonresidential direct contact soil cleanup criteria. The same condition holds for the majority of the metals (sans hexavalent chromium) detected in the soil samples – they were detected sporadically, and, almost without exception, were detected at concentrations above the residential direct contact soil cleanup criteria but below the nonresidential direct contact soil cleanup criteria. *residential direct cleanup criteria < X < commercial direct cleanup criteria*

Hexavalent chromium is the one notable exception with respect to evidence of impacts. This constituent was detected in excess of the nonresidential inhalation-based soil cleanup criterion (i.e., 20 mg/kg) in samples obtained from multiple borings installed proximate to the planned barrier wall alignment and proximate to, or in, the planned consolidation area. In fact, hexavalent chromium was detected in excess of the nonresidential direct contact soil cleanup criterion in samples from every location along the planned barrier wall alignment and in the planned consolidation area.

It should be noted that trivalent chromium has not been detected in excess of its soil cleanup criteria in any of the samples collected at the Diamond Site to date and, therefore, is not considered to be of importance for the purposes of this similarity assessment. It is also considered important to note that many of the surficial samples obtained from the western portion of the Diamond Site are reflective of soil placed at the Site as a surface cover at the time the production plant was razed. The analytical data for samples obtained below grade are considered most indicative of the nature of the materials present along the barrier wall alignment and in the consolidation area.

Inspection of Figure 1-5 demonstrates that the nature of the materials to be consolidated is consistent with the nature of the materials that exist in the consolidation area. Specifically, the following conditions are evident from Figure 1-5:

- Hexavalent chromium concentrations exceed the nonresidential direct contact soil cleanup criteria along both the barrier wall alignment and in the consolidation area;
- The range of concentrations detected in samples obtained along the alignment (up to 17,100 mg/kg) is similar to the range of concentrations detected in samples from the consolidation area (up to 12,700 mg/kg);
- The average hexavalent chromium concentration in the barrier wall alignment samples (4,200 mg/kg) is consistent with the average hexavalent concentration in the consolidation area (3,500 mg/kg).

In conclusion, the exiting data for the Diamond Site are considered adequate to demonstrate that the target materials and the planned consolidation area exhibit similar chemical characteristics (constituents and concentrations).

SCCC Site Target Materials and Consolidation Area Chemical Composition

The compilation of data from the various historical investigations for the SCCC Site provides sufficient data to demonstrate that the target materials and the planned consolidation area are chemically similar. Figures 1-6 through 1-9 are summaries of relevant analytical data for the proposed consolidation area and the various target materials.

Figure 1-6 displays the analytical results for soil, sediment, and lagoon solid samples obtained in the proposed consolidation area. Primary constituents of interest detected in the consolidation area solid matrices consist of the following:

- Polynuclear aromatic hydrocarbons
- Phenol and substituted phenols
- Various chlorinated benzenes
- Metals (lead and mercury in one sample)
- Tetrachlorodibenzodioxin
- Hexavalent chromium (one sample)

These primary constituents of interest consist of those constituents detected in at least one sample in excess of the most stringent of the residential/nonresidential direct contact/inhalation-based or impact to groundwater soil cleanup criteria as well as a constituent of interest for which a soil cleanup criterion has not been promulgated but is nonetheless of particular interest for the Site (i.e., tetrachlorodibenzodioxin [TCDD]). Note that 1 part per billion (1 ug/kg or 0.001 mg/kg) is considered a reasonable benchmark for TCDD or TCDD equivalents but has not been used as a basis for preparation of the figures (i.e., all dioxin results have been reported on the figures regardless of whether they exceed 1 ppb).

Figure 1-7 provides additional information regarding the nature of impacts in the planned consolidation area. Figure 1-7 displays the constituents detected in shallow groundwater samples obtained proximate to, and down-gradient, of the lagoon. Results in excess of the NJDEP Class II-A Groundwater Quality Standards are summarized. As shown on Figure 1-7, the following constituents are present in the consolidation area at concentrations sufficient to result in impacts to groundwater:

- Polynuclear aromatic hydrocarbons (naphthalene)
- Phenol and substituted phenols
- Benzene and various chlorinated benzenes
- Various chlorinated aliphatics (e.g., trichloroethene)
- Various metals in unfiltered samples
- Hexavalent chromium

Note that a fully enclosing barrier wall and a hydraulic control system are planned as major components of the Interim Response Action. Consequently, groundwater impacts and the impact to groundwater soil cleanup criteria are not considered germane to a successful

Interim Response Action. Nonetheless, evaluation of the groundwater impacts is considered appropriate to the similarity issue.

Figure 1-8 displays the analytical results for the barrier wall alignment and the south ditch at the SCCC site. As shown on Figure 1-8, primary constituents of interest detected in the onsite target materials consist of the following:

- Polynuclear aromatic hydrocarbons
- Various chlorinated benzenes
- Various metals
- Tetrachlorodibenzodioxin

In addition, polychlorinated biphenyls were detected in one sample at a concentration above the residential direct contact soil cleanup criteria but below the non-residential direct contact soil cleanup criteria. Two samples contained a pesticide (dieldrin) at concentrations above the residential direct contact soil cleanup criteria but below the non-residential direct contact soil cleanup criteria.

Figure 1-9 displays analytical data for the near-shore Hackensack River sediments. As shown on Figure 1-9, primary constituents of interest detected in the offsite target materials are as follows:

- Polynuclear aromatic hydrocarbons
- Benzene and various chlorinated benzenes
- Various chlorinated aliphatics (e.g., trichloroethene)
- Various metals (including hexavalent chromium in one sample)
- Tetrachlorodibenzodioxin

Note that none of the dioxin concentrations for the near-shore sediment samples exceed the 1 ug/kg benchmark discussed previously. Consequently, the presence of dioxin in the near-shore sediments is not considered to be of concern from the standpoint of onsite consolidation.

Based on review of the data, it is evident that the same constituents have been detected in the target materials and in the consolidation area. Concentrations are considered similar in that they exceed either the direct contact soil cleanup criteria or impact to groundwater soil cleanup criteria or both. The following lists summarizing the lists of constituents of interest detected in the consolidation area and the target materials in excess of soil cleanup criteria:

Consolidation Area

Polynuclear aromatic hydrocarbons
Benzene/various chlorinated benzenes
Various chlorinated aliphatics
Various trace metals
Tetrachlorodibenzodioxin
Hexavalent chromium
Phenol and substituted phenols

Target Materials

Polynuclear aromatic hydrocarbons
Benzene/various chlorinated benzenes
Various chlorinated aliphatics
Various trace metals
Tetrachlorodibenzodioxin
Hexavalent chromium

The south ditch sediments contain elevated concentrations of constituents of interest relative to the near-shore sediments. The lagoon solids contain elevated concentrations of constituents of interest relative to the surrounding soils in the proposed consolidation area. Consequently, the consolidation activities are expected to involve the consolidation of the south ditch sediments to the lagoon area and the near shore river sediments and slurry wall spoils in the remaining portion of the proposed consolidation area.

Finally, a contingency will be included in the IRAW such that additional land-side soil samples will be obtained from the consolidation area(s) in the event that supplemental data are required to complete the target material/consolidation area similarity assessment in consideration of new analytical data acquired pursuant to the implementation of the IRAW.

ISSUE NUMBER 3

Requirement: Pursuant to N.J.A.C. 7:26E-5.1(c)1, select a remedial action which is protective of public health and the environment.

Description of Noncompliance: The IRAW provides an alternate approach to deal with the "Site Target Materials" should the Responsible Parties fail to secure USEPA concurrence regarding the use of the AOC policy. Specifically, the IRAW proposes "If concurrence is not obtained, characteristic materials will be managed offsite and non-characteristic materials will be managed onsite". It is the Department's position that in the event that the AOC policy cannot be employed as proposed, the Responsible Parties must properly classify and dispose of generated wastes (hazardous and non-hazardous) at permitted offsite disposal/treatment facilities. Furthermore, if the Responsible Parties desire to "reuse" non-hazardous wastes on site (as backfill), the IRAW must include the provision for the submission of a Soil Reuse Evaluation as required by N.J.A.C. 7:26E-6.2(b) and 6.4(d).

Important:
Get Toward
Letter

RESPONSE TO ISSUE NUMBER 3

The IRAW will be revised to indicate that all materials will be properly classified and that hazardous materials will be treated/disposed at permitted offsite facilities in the event that the AOC Policy cannot be employed. The IRAW will also be revised to indicate that a Soil Reuse Evaluation will be completed in the event that 1) the AOC Policy cannot be employed; 2) the materials are determined to be nonhazardous, and 3) the PRG wishes to reuse the materials onsite as fill. A Soil Reuse Proposal for such materials will be submitted to the NJDEP, and, contingent upon NJDEP approval/disapproval of the proposal, the nonhazardous materials may either used as fill onsite or disposed offsite at permitted facilities, respectively. The soil reuse proposal will consist of the information required pursuant to 7:26E-6.2(b) and 6.4(d). The proposed text revisions are attached for NJDEP review.

The sampling and analysis requirements specified at N.J.A.C. 7:26E-6.4(d) for the Soil Reuse Evaluation and Proposal will be satisfied using an alternate sampling and analysis approach (for

up to date

soil volumes greater than 1,000 cubic yards) subject to NJDEP approval. The sampling and analysis approach is summarized in response to Issue Number 5.

ISSUE NUMBER 4

Requirement: Pursuant to N.J.A.C. 7:26E-5.1(c)1, select a remedial action which is protective of public health and the environment.

Description of Noncompliance: The IRAW includes a "Material Management Decision Flowchart" identified as Figure 1-3. This figure fails to include the pathway to obtain on site soil reuse as discussed in Issue 3 above.

RESPONSE TO ISSUE NUMBER 4

Figure 1-3 will be revised to include the soil reuse evaluation(s), submittal of the soil reuse proposal(s), NJDEP review and approval/denial and appropriate onsite or offsite disposition of the materials. A draft version of Figure 1-3, which is consistent with the response to Issues 3 and 4, is attached for review.

ISSUE NUMBER 5

Requirement: Pursuant to N.J.A.C. 7:26E-6.2(a)7, a quality assurance project plan including proposed sampling and analytical methods pursuant to N.J.A.C. 7:26E-2.2 must be submitted with the IRAW.

Description of Noncompliance: The IRAW states that "Target Materials" and wastes will undergo waste classification sampling and analysis, however, the document fails to discuss/reference the appropriate waste classification sampling protocol/sampling frequency that will be employed (with the exception of the lagoon solids). The IRAW must provide detailed specifications for the collection, analysis and evaluation of all media/wastes.

RESPONSE TO ISSUE NUMBER 5

Waste classification sampling and analysis was discussed in the May 2007 version of the IRAW on a remedy component-specific basis. Waste classification sampling and analysis was discussed in the following subsections of the May 2007 IRAW:

- Barrier Wall Data Acquisition (Slurry Wall Spoils)
- DNAPL Recovery System Data Acquisition (Recovered DNAPL)

- Lagoon Backfilling and Dewatering Data Acquisition (Lagoon Solids)
- Near-Shore Sediment Management Data Acquisition (Near-Shore River Sediment)
- Site Preparation Activity Data Acquisition (South Ditch Soft Sediments)

In addition, waste classification sampling and analysis was also discussed in the attendant Quality Assurance Project Plan and Field Sampling Plan provided as Appendices D and E, respectively, in Volume II of the IRAW. Waste classification sample locations were also shown on Figure 4-1.

It is believed that the nomenclature used for the subsections that discussed the waste classification sampling and analysis may have resulted in the apparent confusion with respect to this issue. While Section 4.4 (Lagoon Dewatering and Backfilling Data Acquisition) included a specific subsection entitled "Waste Classification Data Acquisition", other subsections that included discussions of waste classification sampling and analysis were given alternate names. These alternate names were used, in most cases, because the relevant section includes collection of data above and beyond that required for classification purposes.

For example, the DNAPL Recovery System Data Acquisition section (Section 4.3) included a subsection entitled "DNAPL Chemical Testing" which includes collection of data to assess treatment/disposal options. Section 4.1 (Barrier Wall Data Acquisition) included a subsection entitled "Chemical Analytical Data Acquisition" that is in fact the waste classification sampling and analysis.

To alleviate the apparent misconception regarding the waste classification issue, the scope of the waste classification sampling and analysis program has been reviewed in detail, and several revisions are planned in response to this issue, as follows (please note that, as permitted by the NJDEP's Waste Classification Form and Instructions, a Site-specific sampling protocol is proposed):

- Each of the relevant data acquisition sections in Section 4.0 of the IRAW will include a standalone subsection entitled "Waste Classification Data Acquisition" and each of these standalone sections will summarize the scope of the site- and media-specific waste classification sampling and analysis program (i.e., the type and number of samples, the volume of material represented by the samples, the sample depth if applicable, and the analytical program);
- The number of samples, cubic yards of material represented by the samples (i.e., the sample "frequency"), the type of samples to be obtained (i.e., discrete grab samples), sample depths, and the scope of the analytical program will be discussed in the subsections. Appropriate figures displaying the waste classification sampling locations will be referenced;
- A discussion of the procedural requirements will be provided in each subsection. Reference to preparation and submittal of a waste classification request form for NJDEP review and approval will be included;
- The scope of the waste classification sampling and analysis program will be expanded to include collection and analysis of five (5) additional samples to be

representative of the spoils from the hydraulic control system trench installations (i.e., the hydraulic control system piping runs to the treatment plant);

- The scope of the waste classification sampling and analysis program will be expanded to include the collection and analysis of twenty (20) additional discrete grab samples from the near-shore Hackensack River sediment (please refer to the response to Issue 11);

Each of the waste classification samples will be analyzed for the following (at a minimum):

- TCL VOCs
- TCL SVOCs
- TAL Metals/CN
- Cr VI
- PCDDs/PCDFs
- Total PCBs
- TCLP VOCs
- TCLP SVOCs
- TCLP Metals
- RCRA Characteristics

The proposed text revisions are attached for NJDEP review. Note that analytical information exists for the containerized materials. Bids have previously been solicited for this material and potential offsite treatment and disposal facilities have been identified as subsequently discussed in response to Issue 7. Based on the existence of historical data, prior communication with potential offsite treatment and disposal facilities, and NJDEP's interest in expediting the removal of these materials, additional waste classification sampling and analysis is deemed neither appropriate nor necessary for these materials. Bidders have provided proposals which include any requisite sampling and analysis to ensure that the materials meet their facility's acceptance criteria.

ISSUE NUMBER 6

Requirement: Pursuant to N.J.A.C. 7:26E-6.1(b)3, each remedial action implemented at a site shall comply with an applicable Federal, State and local laws, regulations and requirements.

Description of Noncompliance: The IRAW fails to reference that any PCB contaminated media will be remediated in accordance with the USEPA's Toxic Substance Control Act (TSCA).

RESPONSE TO ISSUE NUMBER 6

The SCCC Containerized Material and SCCC Transformer Pad descriptions in Section 3.7 of the IRAW will be revised to indicate that any PCB-contaminated media will be remediated in accordance with TSCA requirements. It is planned that guidance outlined in a November 2005 USEPA guidance document entitled Polychlorinated Biphenyl (PCB) Site Revitalization Guidance Under the Toxic Substances Control Act (TSCA) will be followed. Note that the low concentrations of PCBs encountered to date in the majority of the

containerized materials and environmental media other than that in the immediate vicinity of the SCCC Transformer Pad do not trigger TSCA requirements. The proposed text revisions are attached for NJDEP review.

ISSUE NUMBER 7

Requirement: Pursuant to N.J.A.C. 7:26E-6.1(b)3, each remedial action implemented at a site shall comply with all applicable Federal, State, and local laws, regulations and requirements.

Description of Noncompliance: On page 3-22 of the IRAW, it is stated that the SCCC Containerized Materials will be disposed of "based on the availability of off-site disposal options". Furthermore, the IRAW proposes, that if materials cannot be disposed offsite, a specific proposal to consolidate these materials onsite beneath the final surface cover will be submitted as part of the final site remedy. It is the NJDEP's understanding that the "Containerized Materials" referred to, are the dioxin contaminated asbestos wastes that have been stored on site within steel (Sealand) containers. These wastes have been stored on-site for many years and their disposal/treatment at an appropriate off-site facility is long overdue. Therefore, pursuant to the Solid Waste Management Act, N.J.A.C. 7:26-1.1 et seq., the IRAW must include the classification and off-site disposal or treatment of these solid wastes as part of this interim remedial action. The NJDEP cannot continue to allow these potentially hazardous wastes to remain on-site beyond the timeframes allowed, pursuant to N.J.A.C. 7:26-1.1(a)6.

RESPONSE TO ISSUE NUMBER 7

Historically, a containerized material inventory was generated and sampling and analysis of these materials was completed. The descriptive information was sufficient for potential waste management facilities to prepare bids for the removal of the material. Bidders provided proposals that included sampling and analysis for classification purposes to ensure that their acceptance criteria were met. Note that the majority of the dioxin-containing materials in the Sealand containers (i.e., the ACM) are considered low-level dioxin wastes. Facilities exist that are likely to accept much of these materials.

It is proposed that the discussion of the containerized material management component of the IRA provided in Section 4.7 be expanded to indicate the following:

- As permitted by the NJDEP Waste Classification Form and Instructions, a Site-Specific protocol is proposed for completing the classification of the containerized materials. A Waste Classification Form will be prepared for NJDEP review based on process knowledge and historical analytical data for the containerized materials;

- Additional bids will be solicited from permitted facilities to complete any requisite acceptance criteria sampling and analysis, segregate the materials, over-pack as necessary, and transport and treat/dispose the materials;
- Bid evaluation will be completed and a successful bidder (or bidders) will be retained to complete the containerized material management task;

The general containerized material management discussion in Section 1.4 (Scope of the Interim Response Action) will be revised to reference Section 4.7 and the reference to onsite consolidation beneath the final cover will be removed. The proposed text revisions are attached for NJDEP review.

ISSUE NUMBER 8

Requirement: Pursuant to N.J.A.C. 7:26E-5.1(c)2, the person responsible for selecting the remediation shall select, develop, and implement a remedial action that is implementable.

Description of Noncompliance: The IRAW proposes off-site disposal of certain containerized wastes and other media/wastes that may be generated during the proposed remedial actions. The IRAW also infers that there may not be approved facilities to accept certain waste types. The NJDEP acknowledges that until such time as waste classification sampling and analyses are completed, the specific disposal/treatment facilities, which may receive the wastes, cannot be confirmed. However, as originally required within NJDEP's April 11, 2007 NOD (Comment #14), the IRAW must provide a list of the names and addresses of potential certified/permitted disposal/treatment facilities that are available and could be utilized based upon the known site contaminants (especially dioxin) and wastes streams that may be generated during implementation of this IRAW. In the absence of such a list, the IRAW may not be implementable, as proposed.

RESPONSE TO ISSUE NUMBER 8

Please note that Comment #14 of the April 11, 2007 NOD directed the Group to identify facilities that could accept materials for the Site and the Group complied with that requirement. No request to list the facilities was made by the NJDEP in the April 11, 2007 NOD. Numerous facilities should be able to take the majority of the materials that may be generated as a result of the Interim Response Action. Facilities that are capable of taking "high-level" dioxin-containing materials are expected to be the most challenging to identify. Based on preliminary discussions with TSD facilities, the following potential permitted treatment and/or disposal facilities that may currently accept dioxin-containing materials have been identified:

Bennett Environmental, Inc.
Thermal Oxidation Facility
1540 Cornwall Road, #208
Oakville, ON L6J 7W5

Veolia Environmental Services (Onyx)
Thermal Oxidation Facility
Highway 73
Port Arthur, Texas 77640

Clean Harbors Canada, Inc.
Lambton (Sarnia) Landfill
4090 Telfer Road, Rural Route #1
Corunna, ON N0N 1G0
Canada

Stablex Canada Inc.
760 Industrial Blvd.
Blainville, Quebec
J7C 3V4
Canada

The preceding list of potential offsite TSD facilities will be included in Section 1.4 (Scope of the Interim Response Action) of the revised IRAW. The proposed text revisions are attached for NJDEP review.

ISSUE NUMBER 9

Requirement: Pursuant to N.J.A.C. 7:26E-6.2(a)5, the IRAW shall include a detailed description of the remedial action and the remedial technology to be conducted for each area of concern.

Description of Noncompliance: The IRAW proposes the construction of an interim surface cover that will consist of a 1 foot thick layer of coarse aggregate cap underlain with geotextile fabric. The proposed 1 foot interim cap is acceptable. However, on page 3-13 it is stated that upon completion of dewatering, the lagoon will be backfilled to meet the surrounding grade using either clean borrow material, or excavated river sediments. Conversely, Figure 3-6 indicates that the backfill and interim surface cap will extend well above the surrounding grade to create a mounded lagoon area, the elevation of which will depend upon the final quantities of backfilled materials. Therefore, the total thickness of material placed over the lagoon solids, including the cap and backfill material, will exceed 1 foot. Furthermore; the total thickness of material placed on top of the lagoon solids is not identified within the IRAW. This proposal is inconsistent with NJDEP's April 11, 2007 NOD (Comment #20), which required the minimum interim cap thickness necessary for stormwater management and to prevent direct contact with contaminants. The placement of excessive volumes of backfill within the lagoon could complicate the final remedy for this area of concern. Therefore, the IRAW must be revised to propose a minimum cap thickness and not be based upon maximizing the volume of contaminated excavated media that can be consolidated within the lagoon portion of the proposed AOC.

RESPONSE TO ISSUE NUMBER 9

The design and corresponding configuration of the surface cover over the SCCC Site IRA Consolidation Area has been revised to minimize the thickness of fill placement directly over the lagoons. This grading approach will result in a surface cover slope of

approximately two (2) percent which is considered a practical minimum to ensure proper stormwater management. Figure 3-6 (Proposed Lagoon Backfilling and Consolidation Area Details) has been revised accordingly and is attached.

Once dewatering of the lagoons is completed, the sequence of fill consolidation and surface cover placement for the SCCC Site IRA Consolidation Area will be as follows:

- Geogrids and/or coarse crushed stone will be placed in soft spots in the surface of the lagoon solids (if any) to increase bearing capacity.
- A geotextile separation layer will be placed on top of the dewatered lagoon surface, to segregate the lagoon contents from subsequently placed cover soils. Segregation of the backfill materials from the existing lagoon solids with a geotextile material will facilitate future implementation of a final remedy;
- Soft soils from the south drainage ditch (approximately 4,700 cubic yards) will be placed into the remaining void space within the lagoons. These soft soils will fill the lagoons approximately to the top of the existing containment berms. Constituents present in the south ditch sediments are similar to those in the lagoon solids (i.e., dioxins and semi-volatile organics);
- Emplacement of geogrids, if required, within the consolidated soft soils from the drainage ditch, to increase the bearing capacity of the fill material;
- Placement of excavated river sediments (approximately 6,700 cubic yards) within the SCCC Site IRA Consolidation Area;
- Placement of slurry wall spoils and additional spoils resulting from conduit trench excavation activities (from only the SCCC Site, approximately 4,000 cubic yards) within the entire SCCC Site IRA Consolidation Area.
- These river sediments and slurry wall/trench spoils will cover the entire Consolidation Area and will be graded downward from the central portion of the area to the lateral limits at a slope of approximately two (2) percent.
- Installation of a geotextile separation layer over the consolidated materials; and,
- Construction of the one (1) foot thick gravel surface cover over the entire SCCC Site IRA Consolidation Area.

The revised surface cover configuration is presented on revised Figure 3-6 of the IRAW. The proposed text revisions are attached for NJDEP review. Note that Figure 3-6 of the previous IRAW was not drawn to scale and thus reflected a vertical exaggeration that did not appropriately depict the anticipated fill height over the lagoon. The revised figure (attached) is drawn with a much less exaggerated horizontal to vertical scale (i.e., 2H:1V) and thus provides a more representative depiction of the proposed fill height. Again, this configuration and corresponding fill height are considered the minimum to provide for positive surface water drainage from the surface cover.

The preceding configuration is based on the assumption that all currently anticipated SCCC target materials will be consolidated in the specified consolidation area (i.e., consolidation of the maximum volume). If certain portions of the aforementioned materials are ultimately deemed unsuitable for consolidation within the SCCC Site IRA Consolidation Area, the following adjustments will be made:

- These materials will be disposed off-site in accordance with applicable regulations; and,
- The SCCC Site IRA Consolidation Area "footprint" will be reduced (i.e., the coverage moved inward from the southern limit) to achieve the required minimum surface grades with less materials, or clean off-site borrow soils will be imported to offset the volume deficit.

ISSUE NUMBER 10

Requirement: Pursuant to N.J.A.C. 7:26E-6.2(a)5, the IRAW shall include a detailed description of the remedial action and the remedial technology to be conducted for each area of concern.

Description of Noncompliance: The IRAW proposes the stockpiling of excavated river sediments for dewatering and conditioning, prior to placement. However, the IRAW does not provide the necessary specifics including; the placement location, the collection and treatment/disposal methods of dewatering liquids, erosion and stormwater control measures, additional permitting, etc. These details must be discussed and identified (on figures) within the IRAW.

RESPONSE TO ISSUE NUMBER 10

The text of the IRAW will be revised to include more detail regarding the sediment excavation, dewatering, and conditioning activities and a new figure showing the planned land-side sediment management approach will be prepared and included. This new figure is attached (Figure 3-7). The proposed text revisions are attached for NJDEP review. Two phases of sediment management are planned. Phase I will consist of management of the South Ditch sediments. Phase II will consist of management of the near-shore Hackensack River sediments. Additional information regarding the management of the near-shore sediments is provided in the remainder of this response.

It is planned that a long-reach excavator (LRE) will be staged adjacent the excavation area to perform sediment removal and backfilling activities. A turbidity curtain will be placed within the river, outboard of the limits of excavation, to provide for containment of the excavation cell. Curtains will protect the Hackensack River from turbidity and erosion resulting from both excavation and backfilling activities. One or more sediment drying beds will be constructed within the southern portion of the SCCC Site IRA Consolidation Area, to receive the

excavated river sediments. An earthen berm will be constructed around the drying bed(s) to provide for containment of free water resulting from gravity dewatering of the sediments. Silt fences will be installed on the exterior side of the berms in accordance with prescribed soil erosion and sediment control procedures.

Sediments will be transported from the excavation area to the drying beds with lined dump trucks or roll-off boxes, or directly loaded into the beds with the long-reach excavator. Provisions for spill management will be implemented during sediment excavation and transport. These provisions may include temporary berms/diversions to direct spills to discrete points of collection, and/or placement of plastic sheeting or a geomembrane over the ground surface in areas of sediment transport.

Drying of the excavated sediments is anticipated to take roughly one (1) week depending on weather conditions. If necessary, cement, fly ash or another amendment will be added as necessary to facilitate drying and to condition the sediment for overlying surface cover construction. Because some excess water is expected to occur, the sediment drying beds will be constructed to promote sheet flow to one end of the beds.

As a preliminary worst case estimate, it has been assumed that the water generated as a result of sediment excavation (i.e., that which freely drains from the sediment) will be equivalent to 50 percent of the excavated sediment volume. Accumulated water will either be treated onsite and discharged to the Hackensack River under a general permit or will be treated offsite. Note that sediment excavation rates may vary contingent upon the volume of water requiring treatment, sediment drying rates, and/or available receiving space in the consolidation area.

Remediation that includes discharge to surface water (DSW) for remediation projects is regulated by the NJDEP Bureau of Point Source Permitting. Discharge of the water to the Hackensack River generated from the gravity dewatering of the sediments in the drying beds would qualify for a Request For Authorization (RFA) for a General Permit No. NJ 0155438 for a NJPDES discharge to surface water. Upon application and receipt of a RFA for General Permit No. 0155438, discharge would be authorized for an anticipated six (6) month period.

ISSUE NUMBER 11

Requirement: Pursuant to N.J.A.C. 7:26E-6.2(a)5, the IRAW shall include a detailed description of the remedial action and the remedial technology to be conducted for each area of concern.

Description of Noncompliance: The IRAW proposes to characterize near-shore sediment in accordance with guidance for dredged materials/waste classification requirements (i.e., homogenization of 3 foot sediment core into one composite sample) in anticipation of onsite placement and/or offsite disposal. However, prior to excavation, sediments must also be evaluated in accordance with N.J.A.C. 7:26E - 3.8, 3.11, 4.5, and 4.7. In order to document the contaminant types and concentrations (total concentrations) of the sediment to be relocated on site, data from discrete river sediment samples are required. The need for the collection of discrete samples was previously identified within NJDEP's April 11, 2007 NOD (Comment #23). Data collected from discrete sediment samples will help ensure that

the Responsible Parties are conducting consolidation and/or reuse, in accordance with NJDEP and USEPA requirements (see Comment #2 above). As stated within the NJDEP's April 11, 2007 NOD (Comment #18), the NJDEP will be providing review comments on Standard Chlorine's November 2000 "Baseline Ecological Evaluation" (BEE) in the very near future. The data collected from the required discrete sediment samples will also enable Standard Chlorine to address NJDEP's comments related to the BEE. Furthermore, the sediment toxicity tests for the Diamond site (discussed on page 2-28 of the IRAW) were conducted at peril and considered highly uncertain by NJDEP (Demarest to Sugihara, 8/24/06 comment memorandum review of "Appendix B Field Evaluation of Chromium Toxicity in Sediments from the Hackensack River" in the "Response to NJDEP Comments, Site 113, Remedial Investigation Report"). These issues underscore the Responsible Parties' requirement to fill data gaps prior to excavating and consolidating sediments on site.

✓ We haven't seen this

Therefore, IRAW must propose river sediment sample locations that target depositional areas and confluences of historic site drainage pathways (e.g., historic discharges to the river at the north and south outfalls, adjacent to the 33,000-square-foot lagoon areas of groundwater discharge, etc). Horizontal and vertical characterization and delineation is required and a transect approach is appropriate. Chemical analyses must be consistent with analyses described in Section 6.1.2.1 of the Hackensack River Study Area RIWP, December 2005.

RESPONSE TO ISSUE NUMBER 11

Figure 1-9 (attached) depicts historical near-shore sediment sample locations and analytical results that will be used to support an assessment of possible onsite consolidation. As shown on Figure 1-9, multiple sediment investigations have been completed adjacent to the sites to date. Analytical results for samples collected during the following sediment investigations are shown on Figure 1-9:

- Environmental Resources Management, Inc. – 1997;
- Enviro-Sciences Inc. – 2000;
- Brown and Caldwell – 2001;
- United States Environmental Protection Agency – 2002;
- Brown and Caldwell – 2004.

Historical sediment samples have been collected at a number of transects along the Diamond Site and SCCC Site river frontage, including multiple samples that were obtained in the vicinity of outfalls and potential source areas, such as the lagoon area of the SCCC Site. Samples were analyzed for various analytical suites contingent upon the scope of the investigation. Volatile organic, semi-volatile organic, pesticide, polychlorinated biphenyl, dioxin/furan, and metals analyses (including hexavalent chromium) have been completed to date.

The analytical results depicted on Figure 1-9 consist of those results that exceed criteria that are currently considered potentially appropriate and conservative for the evaluation of possible onsite consolidation. Specifically, results that exceed residential/nonresidential direct contact soil cleanup criteria and/or impact to groundwater criteria are summarized.

Further evaluation of constituents and concentrations for the purposes of onsite consolidation will be made on the basis of similarity of constituents and concentrations.

For the purposes of the Interim Response Action, certain revisions to the previously proposed near-shore sediment sampling and analysis program for near-shore river sediments are proposed to address NJDEP concerns. First, discrete samples will be obtained from the surface of the sediment bed (0-1 foot) and at the maximum depth of the planned excavation (2-3 feet). Second, additional sample locations have been included.

Particular emphasis has been placed ^(How many?) on sampling areas that have not been sampled previously. Transects consisting of two lateral sampling locations are planned at such locations as shown on Figure 1-9. A discrete 0-1 foot grab sample and a discrete 2-3 foot grab sample will be obtained at these transect locations. In accordance with NJDEP guidance, the surface sample will consist of a 0-6 inch biotic zone sample for the majority of the analyses and a 6-12 inch sample for volatile organic analysis. It is planned that these transect sampling points be located 20 and 40 feet from the shoreline.

In addition, it is planned that one 0-1 foot discrete sample (i.e., 0-6 inch and 6-12 inch sample) and one 2-3 foot discrete sample will be obtained 25 feet from the shoreline in areas that have been sampled previously. These samples will be used to confirm historical results and to provide additional waste classification information for areas that have been characterized historically.

The current sampling plan calls for the collection of a total of 26 discrete samples from 13 distinct locations. The analytical program for the sediment samples has been developed based on consideration of the historical data and waste classification requirements. It is planned that the sediment samples will be analyzed for the following:

- TCL Volatile Organics
- TCL Semi-volatile Organics
- TAL Metals and Cyanide
- Polychlorinated Dioxins and Dibenzofurans
- Polychlorinated Biphenyls
- Hexavalent Chromium
- TCLP Volatile Organics
- TCLP Semi-volatile Organics
- TCLP Metals
- RCRA Characteristics (Ignitability, Reactivity, Corrosivity)
- Grain Size
- Total Organic Carbon
- Moisture Content

Note, that the sampling and analysis program for the near-shore river sediments is designed to provide information for the assessment of sediment management options and for waste classification purposes. This information will supplement existing data and will accommodate comparison of near-shore sediment constituents/concentrations with existing constituents/concentrations in the planned consolidation area, evaluation of the potential for soil reuse, preparation of a waste classification form, and/or identification of appropriate

offsite treatment/disposal facilities. The proposed text revisions are attached for NJDEP review.

ISSUE NUMBER 12

Requirement: Pursuant to N.J.A.C. 7:26E-6.3(e), monitoring and performance requirements for natural remediation shall be followed in accordance with N.J.A.C. 7:26E-6.3(e)1-5.

Description of Noncompliance: The IRAW states that the effectiveness of the hydraulic control system will be evaluated via a hydraulic monitoring program that will consist of quarterly measurements of ground water levels for a period of two (2) years. This is not acceptable. System start-up and the first six (6)-months of system operation will require a much greater level of monitoring, evaluation, and adjustment than long-term operation will. Therefore, the IRAW must propose that the measurement of ground water elevations and an assessment of the system effects on subsurface hydraulic conditions will be conducted on a monthly basis for at least the first six-months of operation. This information should also be used to evaluate whether the pumping rates of the system are balanced and adequate enough to meet IRAW objectives. At the end of this six (6) month period, the Responsible Parties can petition the NJDEP to reduce the frequency of measurements, if the results of this monitoring demonstrate that the system is consistently performing as designed.

RESPONSE TO ISSUE NUMBER 12

The description of the hydraulic control system in Section 3.2 of the IRAW will be revised to indicate that monthly monitoring of groundwater levels will be completed for the first six months of operation to demonstrate that hydraulic conditions conducive to containment are achieved. The text will also be revised to indicate that an evaluation of the adequacy of the pumping rate to achieve the desired containment and modification of the pumping rate will be completed as necessary. Furthermore, the text will indicate that, at the end of the 6-month period, the RPG will petition the NJDEP to reduce the frequency of measurement if appropriate based on the results of the measurement program. The proposed text revisions are attached for NJDEP review.